

# Science Intent

## Science at Beaminster St Mary's

At Beaminster St Mary's, we value science as a core subject, which stimulates awe, and wonder in our everyday lives. We believe science can have a transformative effect on children, helping them to become curious and inspired by the world around them. We believe that a high-quality science education should engage, stimulate and challenge pupils, equipping them with the knowledge and skills to better understand their life and their planet. We encourage children to learn from, be inspired by the work of great scientists, and understand the contribution science has made to society, both past and present. As pupils progress, we support them to be able to pose increasingly complex scientific questions and carry out experiments to work accurately and analytically.

At Beaminster St Mary's, science is taught weekly. Teachers plan sequences of lessons across the unit that will build on and develop the children's knowledge and skills. Each unit of learning has a strong foundation in new knowledge – linked to prior knowledge – that will support the children to understand increasingly complex scientific phenomena and processes. Scientific vocabulary is mapped and taught rigorously to ensure that children can both recognise, understand and use scientific terminology accurately and confidently. Opportunities to learn outdoors and explore our natural environment are embedded throughout our science curriculum. Carefully selected skills are planned to best match each unit of knowledge and progress year on year. Opportunities to practise and embed skills are planned for so that they are revisited and refined over time. The knowledge and skills that children will develop throughout each science topic are mapped across each year group and across the school to ensure progression.

## Curriculum Drivers

	In all subjects...	In Science, this looks like...
Curiosity	We aspire for pupils to embrace challenge with a growth mind set and show curiosity, independence and resilience in all that they do.	<ul style="list-style-type: none"> <li>• Opportunities to explore and experience through practical activities.</li> <li>• Asking and asking questions.</li> <li>• Predicting, hypothesising and testing.</li> </ul>
Admiration	We aspire for pupils to become wise, respectful learners	<ul style="list-style-type: none"> <li>• Appreciation of natural phenomena.</li> <li>• Appreciation of nature and the world around us.</li> <li>• Exploration of the best that has been thought and said by scientists.</li> </ul>
Communication	We aspire for pupils to become emotionally mature with a depth of language that enables them to share ideas effectively.	<ul style="list-style-type: none"> <li>• Learning, understanding and using scientific vocabulary.</li> <li>• Communicating accurately and effectively in written science.</li> <li>• Developing skills of debate to challenge their own and others thinking.</li> </ul>
Worldly	We aspire for pupils to become emotionally literate, tolerant and appreciative of an ever-changing global environment.	<ul style="list-style-type: none"> <li>• Understanding of national and international science innovation.</li> <li>• Knowledge of the impact of global events.</li> <li>• Knowledge of what science is telling us about our own impact on the planet and how we can contribute to a more sustainable world.</li> </ul>

Learning knowledge is not an end point in itself, it is a springboard to learning more knowledge. Each unit in our overview is underpinned by rich, substantive knowledge and ambitious vocabulary, whilst also ensuring children are developing their disciplinary knowledge (historical skills). Each unit of work is planned carefully to ensure concepts are taught in optimal order to support children's understanding. As well as developing a breadth of subject knowledge, we want our children to develop subject specific skills. In addition to substantive and disciplinary knowledge, children will develop their experiential knowledge through carefully planned enrichment activities.

	EYFS	Year 1 and Year 2	Year 3 and Year 4	Year 5 and Year 6
Cycle 1	Our Bodies Animals Life Cycles Materials	Animals 1 and 2 Materials 1 Everyday Materials	Light 3 Animals 3 Animals 4 Rocks 3 States of Matter 4	Earth and Space Animals 5 Animals 6 Materials Evolution
Cycle 2		Plants 1 and 2 Seasonal Changes Habitats	Forces and Magnets Plants Sound Electricity Habitats	Light Habitats Forces Electricity

## Substantive Concepts – these are the concepts that give a subject substance or content.

Our curriculum is refined yearly, but it maintains a consistent knowledge base to ensure conceptual progression. We have identified a set of key substantive concepts that children will repeatedly revisit throughout their time at St Mary's. Our substantive concepts are:

### Biology

<p><b>7 Life Processes</b></p> <p>Organisms are organised on a cellular basis and have a finite life span</p>	<p><b>Nutrition</b></p> <p>Organisms require a supply of energy and materials for which they often depend on, or compete with, other organisms</p>	<p><b>Reproduction</b></p> <p>Genetic information is passed down from one generation of organisms to another</p>	<p><b>Diversity or classification</b></p> <p>The diversity of organisms, living and extinct, is the result of evolution</p>
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### Chemistry

<p><b>Materials</b></p> <p>All matter in the Universe is made of very small particles</p>	<p><b>Earth Science</b></p> <p>The composition of the Earth and its atmosphere and the processes occurring within them shape the Earth's surface and its climate</p>
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### Physics

<p><b>Earth and Space</b></p> <p>Our solar system is a very small part of one of billions of galaxies in the Universe</p>	<p><b>Energy</b></p> <p>The total amount of energy in the Universe is always the same but can transferred from one energy store to another during an event</p>	<p><b>Contact Forces</b></p> <p>Changing the movement of an object requires a net force to be acting on it</p>	<p><b>Non-Contact Forces</b></p> <p>Objects can affect other objects at a distance</p>
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## Second order concepts – Shape the enquiry

<p><b>pattern</b></p> <p>When anything repeats itself in a predictable way e.g. behaviour, data. Using this information to make predictions or explain.</p>	<p><b>change</b></p> <p>When something becomes different from its original form and the associated scientific processes that may have taken place to cause this.</p>	<p><b>classification</b></p> <p>How things can be grouped or sorted according to different characteristics or criteria.</p>
<p><b>compare and contrast</b></p> <p>The identification and justification of similarities and differences</p>	<p><b>relationship</b></p> <p>Cause and effect, the why and the what; the combination of action and reaction.</p>	<p><b>categorisation</b></p> <p>Grouping according to specific criteria e.g. vertebrates, conductors</p>
<p><b>structure and function</b></p> <p>The component parts that make up a living thing and how each part serves to support survival.</p>	<p><b>diversity</b></p> <p>Scientific progress relies on problem solving and collaboration. Groups composed of people with diverse experiences and areas of expertise tend to be more creative and innovative. Asking questions drives science forward, and scientists with different perspectives often ask different questions.</p>	<p><b>variation</b></p> <p>The differences between living things of the same species – inherited or environmental.</p>

## Progression of Substantive Concepts

Substantive Concept 7 life processes	EYFS	KS1	LKS2	UKS2
<p><b>Organisms are organised on a cellular basis and have a finite life span</b></p>	<p>Know and can talk about similarities and differences between myself and others</p>	<ul style="list-style-type: none"> <li>Find out about and describe the basic needs of animals, including humans, for survival (water, food and air)</li> <li>Identify, name, draw and label the basic parts of the human body and say which part is associated with which sense</li> <li>Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees</li> <li>Identify and describe the basic structure of a variety of common flowering plants, including trees</li> <li>Observe and describe how seeds and bulbs grow into mature plants</li> <li>Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.</li> </ul> <p><b>Vocabulary</b> leg, arm, elbow, head, ear, nose, back, senses, see, hear, touch, smell, taste. survival, water, air, live, living, grow, move, deciduous, evergreen trees, flowers, petals, roots, bulb, reproduce, plants, shoot, earth, soil, seeds, branch, trunk, leaves, grows, stem, fruit, leaf, seeds, bulbs, light, temperature, growth, leaves, nutrition</p>	<ul style="list-style-type: none"> <li>Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers</li> <li>Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant</li> <li>Investigate the way in which water is transported within plants</li> </ul> <p><b>Vocabulary</b> air, light, water, nutrients, soil, reproduction, transportation, structure, function, warmth, leaves, stem, growth</p>	<ul style="list-style-type: none"> <li>Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood</li> </ul> <p><b>Vocabulary</b> circulatory system, heart, blood, blood vessels, carbon dioxide, oxygen, pump, arteries, lungs, veins</p>
<p><b>Organisms require a supply of energy and materials for which they often depend on, or compete with, other organisms</b></p>	<p>Know the importance for good health of physical exercise, and a healthy diet, and talk about ways to keep healthy and safe</p>	<ul style="list-style-type: none"> <li>Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene</li> <li>Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.</li> </ul> <p><b>Vocabulary</b> food, exercise, hygiene, healthy, energy, food chain, predator, prey,</p>	<ul style="list-style-type: none"> <li>Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat</li> <li>Identify the different types of teeth in humans and their simple functions</li> <li>Describe the simple functions of the basic parts of the digestive system in humans</li> <li>Construct and interpret a variety of food chains, identifying producers, predators and prey.</li> </ul> <p><b>Vocabulary</b> mouth, tongue, teeth, oesophagus, stomach, small intestine, large intestine, herbivore, carnivore, omnivore, canine, incisor, molar, diet, healthy, unhealthy, decay, root, balanced diet, nutrition, nutrients, healthy diet, balanced diet, consumer, producer, predator, prey</p>	<ul style="list-style-type: none"> <li>Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function</li> <li>Describe the ways in which nutrients and water are transported within animals, including humans</li> </ul> <p><b>Vocabulary</b> exercise, nutrients, lifestyle, skeletal system, muscular system, digestive system, diet, drugs, nutrients</p>

Reproduction				
<p><b>Genetic information is passed down from one generation of organisms to another</b></p>	<p>Make observations of animals and plants and explain why some things occur, and talk about changes e.g. growing plants, hatching eggs.</p>	<ul style="list-style-type: none"> <li>Notice that animals, including humans, have offspring which grow into adults</li> </ul> <p><b>Vocabulary</b> adult, baby, offspring, kitten, calf, puppy, reproduce</p>	<ul style="list-style-type: none"> <li>Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal</li> </ul> <p><b>Vocabulary</b> dispersal, pollination, flower, life cycle, seed formation,</p>	<ul style="list-style-type: none"> <li>Describe the changes as humans develop to old age</li> <li>Describe the life process of reproduction in some plants and animals</li> <li>Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents</li> <li>Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird</li> </ul> <p><b>Vocabulary</b> foetus, embryo, womb, gestation, baby, toddler, teenager, elderly, growth, development, puberty, mammal, reproduction, insect, amphibian, bird, offspring, germination, pollination, life processes, seed dispersal, vertebrate, invertebrate</p>
Diversity and Classification				
<p><b>The diversity of organisms, living and extinct, is the result of evolution</b></p>	<p>Make observations of animals and plants and explain why some things occur, and talk about changes e.g. growing plants, hatching eggs.</p>	<ul style="list-style-type: none"> <li>Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals.</li> <li>Identify and name a variety of common animals that are carnivores, herbivores and omnivores.</li> <li>Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets).</li> <li>Explore and compare the differences between things that are living, dead, and things that have never been alive</li> <li>Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other</li> <li>Identify and name a variety of plants and animals in their habitats, including micro-habitats</li> </ul> <p><b>Vocabulary</b> fish, reptiles, mammals, birds, amphibians, herbivore, omnivore, carnivore, wings, beak,</p>	<ul style="list-style-type: none"> <li>Identify that humans and some other animals have skeletons and muscles for support, protection and movement</li> <li>Recognise that living things can be grouped in a variety of ways</li> <li>Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment</li> <li>Recognise that environments can change and that this can sometimes pose dangers to living things</li> </ul> <p><b>Vocabulary</b> classification, classification key, keys, environment, danger, habitat, flowering, non-flowering, human impact, vertebrate, invertebrate, fish, mammals, reptiles, amphibians, birds, movement, muscles, bones, skull, nutrition, skeleton, spine, vertebrate, invertebrate, ribs, protection, support, contract, relax, joint</p>	<ul style="list-style-type: none"> <li>Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals</li> <li>Give reasons for classifying plants and animals based on specific characteristics</li> <li>Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago</li> <li>Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution</li> </ul> <p><b>Vocabulary</b> classification, vertebrates, invertebrates, micro-organisms, classify, characteristics, fungus, arachnid, mollusc, insect, crustacean, adaption, evolution, characteristics, genetics, suited, variation, evolve, inherit, inheritance</p>

		living, dead, extinct, habitat, woodland, pond, desert		
<b>Materials</b>				
<b>All matter in the Universe is made of very small particles</b>	Know about and can describe similarities and differences in relation to places, objects, materials and living things.	<ul style="list-style-type: none"> <li>distinguish between an object and the material from which it is made</li> <li>identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock</li> <li>describe the simple physical properties of a variety of everyday materials</li> <li>compare and group together a variety of everyday materials on the basis of their simple physical properties</li> <li>identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses</li> <li>find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching</li> </ul> <p><b>Vocabulary</b> material, metal, plastic, wood, paper, glass, clay, rock, fabric, sand, hard, soft, rough, smooth, shiny, dull, bendy, waterproof, strong, weak, group, object, sort, stretchy, magnetic, transparent, opaque, natural, manmade, manufactured, absorbent, rigid, hot, cold, properties</p>	<ul style="list-style-type: none"> <li>Compare and group materials together, according to whether they are solids, liquids or gases</li> <li>Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C)</li> </ul> <p><b>Vocabulary</b> solid, liquid, gas, evaporation, condensation, particles, temperature, freezing, heating, heated, cooled, melting point, boiling point, oxygen, water, ice, steam, freeze, melt, solidify</p>	<ul style="list-style-type: none"> <li>Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets</li> <li>Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution</li> <li>Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating</li> <li>Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic</li> <li>Demonstrate that dissolving, mixing and changes of state are reversible changes</li> <li>Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.</li> </ul> <p><b>Vocabulary</b> hardness, solubility, transparency, conductivity, magnetic, filter, evaporation, dissolving, mixing, particle, insoluble, soluble, reversible change, irreversible change, mixture, change of state, mix, sieve, separate, solution, dissolve</p>
<b>Earth Science</b>				
<b>The composition of the Earth and its atmosphere and the processes occurring within them shape the Earth's surface and its climate</b>	Talk about the features of my own immediate environment and how environments might vary from one another e.g. forests, seaside	<ul style="list-style-type: none"> <li>Observe changes across the four seasons</li> <li>Observe and describe weather associated with the seasons and how day length varies.</li> </ul> <p><b>Vocabulary:</b></p>	<ul style="list-style-type: none"> <li>Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties</li> <li>Describe in simple terms how fossils are formed when things that have lived are trapped within rock</li> </ul>	

		sun, light, day, night, moon, dark, summer, spring, autumn, winter,	<ul style="list-style-type: none"> <li>Recognise that soils are made from rocks and organic matter.</li> <li>Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</li> </ul> <p><b>Vocabulary</b> evaporation, condensation, particles, temperature, precipitation, water cycle, transpiration, fossils, soils, sandstone, granite, marble, pumice, crystals, absorbent, texture, metamorphic, hard/soft, pebble, magma, grains, volcano, earth, porous, permeable, impermeable, sand, limestone, stone, quartz, slate, chalk, clay</p>	
<b>Earth and Space</b>				
<b>Our solar system is a very small part of one of billions of galaxies in the Universe</b>				<ul style="list-style-type: none"> <li>Describe the movement of the Earth, and other planets, relative to the Sun in the solar system</li> <li>Describe the movement of the Moon relative to the Earth</li> <li>Describe the Sun, Earth and Moon as approximately spherical bodies</li> <li>Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.</li> </ul> <p><b>Vocabulary</b> Earth, Sun, Moon, axis, rotation, day, night, phases of the moon, constellation, star, solar system, shadow, orbit, planets, Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune, Sphere, revolve, spin, sunrise, sunset, light source</p>
<b>Energy</b>				
<b>The total amount of energy in the Universe is always the same but can be transferred from one energy store to another during an event</b>			<ul style="list-style-type: none"> <li>Recognise that they need light in order to see things and that dark is the absence of light</li> <li>Notice that light is reflected from surfaces</li> <li>Recognise that light from the sun can be dangerous and that there are ways to protect their eyes</li> <li>Recognise that shadows are formed when the light from a light source is blocked by an opaque object</li> <li>Find patterns in the way that the size of shadows change.</li> <li>Identify how sounds are made, associating some of them with something vibrating</li> </ul>	<ul style="list-style-type: none"> <li>Recognise that light appears to travel in straight lines</li> <li>Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye</li> <li>Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes</li> <li>Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.</li> </ul>

			<ul style="list-style-type: none"> <li>Recognise that vibrations from sounds travel through a medium to the ear</li> <li>Find patterns between the pitch of a sound and features of the object that produced it</li> <li>Find patterns between the volume of a sound and the strength of the vibrations that produced it</li> <li>Recognise that sounds get fainter as the distance from the sound source increases.</li> <li>Identify common appliances that run on electricity</li> <li>Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers</li> <li>Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery</li> <li>Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit</li> <li>Recognise some common conductors and insulators, and associate metals with being good conductors.</li> </ul> <p><b>Vocabulary</b> light, shadows, dark, transparent, opaque, translucent, light travels, direction, light source, object, sun, night, day, block, reflect, bright, shine, mirror, volume, vibration, wave, pitch, tone, speaker, ear, sound source, noise, insulation, distance, travel, strength of vibrations, duration, wave length, frequency, cells, wires, bulbs, switches, circuits, series, conductors, insulators, buzzers, lamp, battery, electrical circuit, complete circuit, insulate, circuit break, power, parallel, dim, bright</p>	<ul style="list-style-type: none"> <li>Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit</li> <li>Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches</li> <li>Use recognised symbols when representing a simple circuit in a diagram.</li> </ul> <p><b>Vocabulary</b> light beam, reflection, refraction, spectrum, rainbow, colour, light travelling, shiny surface, reflective surface, opaque, mirror, travelling, light rays, source, block, bulb, bright, dim, cells, voltage, volts, components, switches, simple circuit, series circuit, motors, short circuit, resistance, wire, current, conductor, insulator, circuit, complete circuit, symbol, circuit diagram, electricity</p>
<b>Contact Forces</b>				
<b>Changing the movement of an object requires a net force to be acting on it</b>			<ul style="list-style-type: none"> <li>Compare how things move on different surfaces</li> </ul> <p><b>Vocabulary</b> force, friction, surface, materials, elastic, stretch, squash, compress</p>	<ul style="list-style-type: none"> <li>Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object</li> <li>Identify the effects of air resistance, water resistance and friction, that act between moving surfaces</li> </ul> <p><b>Vocabulary</b> air resistance, water resistance, friction, gravity, Newton, speed, movement, fall, up thrust</p>

Non-contact Forces				
<p><b>Objects can affect other objects at a distance</b></p>			<ul style="list-style-type: none"> <li>• Notice that some forces need contact between two objects, but magnetic forces can act at a distance</li> <li>• Observe how magnets attract or repel each other and attract some materials and not others</li> <li>• Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials</li> <li>• Describe magnets as having two poles</li> <li>• Predict whether two magnets will attract or repel each other, depending on which poles are facing.</li> </ul> <p><b>Vocabulary</b> magnetic, force, contact, attract, repel, poles, push, pull, materials, magnetic material, aluminium, steel, nickel, iron, copper, metal</p>	<ul style="list-style-type: none"> <li>• Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.</li> </ul> <p><b>Vocabulary</b> gears, pulleys, effect, mechanisms, levers, movement</p>

## Progression of second order concepts

	EYFS	KS1	LKS2	UKS2
<b>Pattern</b>				
When anything repeats itself in a predictable way e.g. behaviour, data. Using this information to make predictions or explain.		<ul style="list-style-type: none"> <li>Record their observations e.g. using photographs, videos, drawings, labelled diagrams or in writing.</li> <li>Record their measurements e.g. using prepared tables, pictograms, tally charts and block graphs.</li> <li>Use their experiences of the world around them to suggest appropriate answers to questions. They are supported to relate these to their evidence e.g. observations they have made, measurements they have taken or information they have gained from secondary sources.</li> <li>Use practical resources provided to gather evidence to answer questions generated by themselves or the teacher. They carry out: tests to classify; comparative tests; pattern seeking enquiries; and make observations over time.</li> </ul>	<ul style="list-style-type: none"> <li>Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</li> <li>Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions</li> <li>Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers</li> <li>Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables</li> </ul>	<ul style="list-style-type: none"> <li>Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate</li> <li>Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations</li> </ul>
<b>Change</b>				
When something becomes different from its original form and the associated scientific processes that may have taken place to cause this.		<ul style="list-style-type: none"> <li>Explore the world around them. They make careful observations to support identification, comparison and noticing change. They use appropriate senses, aided by equipment such as magnifying glasses or digital microscopes, to make their observations.</li> </ul>	<ul style="list-style-type: none"> <li>Identify differences, similarities or changes related to simple scientific ideas and processes.</li> </ul>	<ul style="list-style-type: none"> <li>Know the scientific reasons for changes across the range of the science curriculum (biology, physics and chemistry). Give explanations for these and whether changes are reversible.</li> </ul>
<b>Classification</b>				
How things can be grouped or sorted according to different characteristics or criteria.		<ul style="list-style-type: none"> <li>Use their observations and testing to compare objects, materials and living things. They sort and group these things, identifying their own criteria for sorting.</li> <li>Use simple secondary sources (such as identification sheets) to name living things. They describe the characteristics they used to identify a living thing.</li> </ul>	<ul style="list-style-type: none"> <li>Gather, record, classify and present data in a variety of ways to help in answering questions</li> </ul>	<ul style="list-style-type: none"> <li>Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs</li> </ul>
<b>Compare and Contrast</b>				
The identification and justification of similarities and differences		<ul style="list-style-type: none"> <li>Recognise 'biggest and smallest', 'best and worst' etc. from their data and other information.</li> </ul>	<ul style="list-style-type: none"> <li>Set up simple practical enquiries, comparative and fair tests.</li> <li>Make comparisons based on scientific outcomes.</li> </ul>	<ul style="list-style-type: none"> <li>Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.</li> <li>Use test results to make predictions to set up further comparative and fair tests</li> </ul>
<b>Relationship</b>				
Cause and effect, the why and the what; the combination of action and reaction.		<ul style="list-style-type: none"> <li>Identify what has happened in relation to their own experiences and make suggestions as to why e.g. the ice has melted because the temperature has increased</li> </ul>	<ul style="list-style-type: none"> <li>Use straightforward scientific evidence to answer questions or to support their findings.</li> <li>Use scientific vocabulary and knowledge to clearly explain a cause and effect and begin to understand whether change is reversible.</li> </ul>	<ul style="list-style-type: none"> <li>Use scientific knowledge to explain a range of cause and effect scenarios from across the range of the science curriculum (biology, physics and chemistry) e.g. evaporation, dissolving, conduction etc.</li> </ul>

Categorisation				
Grouping according to specific criteria e.g. vertebrates, conductors		<ul style="list-style-type: none"> <li>Categorise using simple prepared tables and sorting rings.</li> </ul>	<ul style="list-style-type: none"> <li>Group and categorise according to specific criteria either pre-determined or by their own criteria. Explain their rationale for this.</li> </ul>	<ul style="list-style-type: none"> <li>Identify the criteria for how animals/materials etc have been pre-grouped or categorised.</li> <li>Use scientific explanations to suggest additions to the category.</li> </ul>
Structure and Function				
The component parts that make up a living thing and how each part serves to support survival.		<ul style="list-style-type: none"> <li>Observe closely, using magnifying glasses, and comparing and contrasting familiar plants; describe how they were able to identify and group them, and draw diagrams showing the parts of different plants including trees. Keep records of how plants have changed over time.</li> </ul>	<ul style="list-style-type: none"> <li>Compare the effect of different factors on plant/animal growth</li> <li>Observe the different stages of plant/animal life cycles over a period of time</li> <li>Make connections between the different parts of plants and animals and how each part supports survival.</li> </ul>	<ul style="list-style-type: none"> <li>Observe how manipulating different variables impacts on how living things grow and survive.</li> <li>Identify the conditions required for all living things to grow and thrive and explain the impact of the removal of one of these.</li> </ul>
Diversity				
Scientific progress relies on problem solving and collaboration. Groups composed of people with diverse experiences and areas of expertise tend to be more creative and innovative. Asking questions drives science forward, and scientists with different perspectives often ask different questions.		<ul style="list-style-type: none"> <li>While exploring the world, develop their ability to ask questions (such as what something is, how things are similar and different, the ways things work, which alternative is better, how things change and how they happen). Where appropriate, they answer these questions.</li> <li>Answer questions developed with the teacher often through a scenario.</li> <li>Plan how to use resources provided to answer the questions using different types of enquiry; recognise that there are different ways in which questions can be answered.</li> </ul>	<ul style="list-style-type: none"> <li>Ask relevant questions and use different types of scientific enquiries to answer them</li> <li>Show understanding and acceptance of the scientific views of others.</li> </ul>	<ul style="list-style-type: none"> <li>Identify scientific evidence that has been used to support or refute ideas or arguments.</li> <li>Use this evidence to support their own investigations.</li> <li>Ask questions to clarify or challenge a scientific perspective.</li> </ul>
Variation				
The differences between living things of the same species – inherited or environmental.		<ul style="list-style-type: none"> <li>observe and record, with some accuracy, the growth of a variety of plants as they change over time. Make suggestions as to similarities and differences.</li> </ul>	<ul style="list-style-type: none"> <li>Accurately observe and record differences observed in plants and animals and make suggestions as to how and why they are similar and different.</li> </ul>	<ul style="list-style-type: none"> <li>Provide scientific evidence for why living things of the same species are different.</li> </ul>
Vocabulary				
		question, identify, sort, group, explore, compare, change, measure, record, observe, diagram, data, describe, pattern, change	experiment, prediction, conclusion, investigation, enquiry, comparison, classify, fair, criteria, contrast, research, cause, effect, variation, structure, function, categorise, relationship	hypothesis, independent variable, dependent variable, control, comparative, primary source, secondary source, illustration, physical, chemical, biological, phenomena, relationship, accuracy, risk, diversity